
Nomenclatural Clarification in *Aristea* Section *Racemosae* (Iridaceae) in the Cape Flora of South Africa

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ABSTRACT. We demonstrate that the correct names for three species of section *Racemosae* of the Afro-Magadagascan genus *Aristea* are: *Aristea capitata* (L.) Ker Gawler, *A. bracteata* Persoon, and *A. bakeri* Klatt. A neotype is selected for *Gladiolus capitatus* L. (1753), the basionym of *A. capitata* (L.) Ker Gawler (1802). *Aristea major* Andrews (1801) is placed in taxonomic synonymy with *A. capitata*. The typification and identity of *Ixia thyrsiflora* D. Delaroche (1766), basionym of *Aristea thyrsiflora* (D. Delaroche) N. E. Brown (1929), often regarded as conspecific with *A. major*, remain in question; however, due to priority of publication of the basionyms *A. thyrsiflora* presents no threat to the stability of *A. capitata*. Weimarck effectively lectotypified the superfluous and illegitimate name *Moraea caerulea* Thunberg (1787), basionym of *Aristea caerulea* (Thunberg) Vahl (1805). *Aristea bracteata* Persoon (1805) is accepted as a replacement name for *M. caerulea*, and is the oldest legitimate name available for this species. *Aristea monticola* Goldblatt (1971) was also published as a replacement name for *M. caerulea*, and thus falls into synonymy with *A. bracteata*. *Aristea bakeri* Klatt (1894) was published as a replacement name for the illegitimate later homonym *A. paniculata* Baker (1892). *Aristea macrocarpa* G. J. Lewis (1940) and *A. confusa* Goldblatt (1970) are placed in taxonomic synonymy with *A. bakeri*.

Key words: *Aristea*, Cape Flora, Iridaceae, South Africa.

been found. Early botanists dealing with the southern African Iridaceae, including Linnaeus's contemporary, C. P. Thunberg, were unanimous that the plant represented a robust species of a group that is now recognized as the Afro-Madagascan genus *Aristea* Aiton (ca. 50 species). The name *Gladiolus capitatus* has long been associated with the species currently known as *A. major* Andrews (1801) or *A. thyrsiflora* (D. Delaroche) N. E. Brown (1929), both of which represent the same plant (Ker Gawler, 1802; Baker, 1892, 1896), or with two other species, *A. macrocarpa* G. J. Lewis or *A. confusa* Goldblatt. The last two names were published for plants known at the time as *A. capitata*, which the respective authors rejected because this name lacked a type and could not be reliably identified to species (Lewis in Weimarck, 1940; Goldblatt, 1971). Confusion about *A. capitata* was such that Weimarck (1940) recognized *A. capitata* despite including its intended replacement name *A. macrocarpa* in the same account. In her account of *Aristea* for the *Flora of the Cape Peninsula*, Lewis (1950c) also regarded *A. capitata* and *A. macrocarpa* as separate species, despite her earlier treatment (Lewis in Weimarck, 1940). To add to the confusion, Goldblatt (1971) published yet another name, *A. confusa*, for the plants called *A. capitata* by Lewis (1950c).

These species are fairly closely related and were all included by Weimarck (1940) in *Aristea* sect. *Racemosae*, a taxon defined by woody capsules with three broad, radial wings that develop from the locules of the ovary with each locule containing between two and twelve radially compressed, lamellate seeds (seed number depending on the species)

The identity of *Gladiolus capitatus* L. (1753), the basionym of *Aristea capitata* (L.) Ker Gawler, has always been uncertain because no type has ever

(Goldblatt & Manning, 1997). Most members of the section are robust plants, often 1 m or more in height, with tough fibrous leaves, and a highly branched compound inflorescence (a synflorescence of binate rhipidia), but a few species are relatively small plants. Goldblatt and Le Thomas (1997) maintained section *Racemosae* in a phylogenetic analysis of *Aristea* that included several pollen characters. They showed that all the species of the section examined have unspecialized pollen grains with a single, smooth aperture and reticulate exine with small lumina. Goldblatt and Le Thomas included section *Racemosae* in *Aristea* subg. *Aristea*, which has two more sections, *Aristea* and *Singulares*. These two sections comprise small plants that resemble section *Racemosae* in their winged capsules and lamellate seeds (doughnut-shaped in *Aristea singularis* of sect. *Singulares*), but they have a dichotomously branched flowering stem, and in section *Aristea* unusually large pollen grains with complex, trisulcate to spiral, confluent apertures and reticulate exine with large lumina.

Aristea capitata was one of the first two species of the genus to be described, the other being *A. africana* (L.) Hoffmannsegg: basionym *Ixia africana* (Linnaeus, 1753). The latter is the type species of *Aristea*, formally named in 1789 in Aiton's *Hortus Kewensis*, actually as we now know by the Swedish botanist Daniel Carl Solander, who was never formally credited with authorship of the genus (Ker Gawler, 1802; Krok, 1925). At the time of its description, *Aristea* included only *A. cyanea* [Solander in] Aiton, an illegitimate synonym of *Ixia africana*. The British petaloid monocot expert John Ker Gawler (1802) transferred *Gladiolus capitatus* to *Aristea* and included *Ixia thyrsiflora* (Delaroche, 1766), *Aristea major* (Andrews, 1801), and *Moraea caerulea* Thunberg (now *A. bracteata* Persoon) as synonyms, indicating a broader interpretation of the species than we now believe is correct. In order to establish a stable taxonomy for *Aristea*, we have the choice of formally proposing the rejection of *Gladiolus capitatus*, an undertaking not certain of favorable outcome, or of choosing a suitable neotype for the species. We have decided on the latter alternative.

NEOTYPIFICATION OF *GLADIOLUS CAPITATUS*

As outlined above, the identity of *Gladiolus capitatus*, the earliest species referable to *Aristea* sect. *Racemosae*, has always been uncertain because of the absence of a type. The name has consistently been used for species of *Aristea* sect. *Racemosae* and has been applied either to the plant currently known as *A. major* or to another species, variously

called *A. bakeri*, *A. macrocarpa*, or *A. confusa*. The most likely species that Linnaeus had in mind when he described *G. capitatus* is the species later called *Aristea major* (Goldblatt & Manning, 2000), which has also been called *A. thyrsiflora* (Brown, 1929; Weimarck, 1940). The protologue of *G. capitatus* (Linnaeus, 1753: 37) refers to a large plant with blue flowers (*planta maxima, floribus caeruleis*), a branched stem (*caule ramoso*), a capitate flowering stem (*capitulis pedunculatis*), and a tuberous rootstock (*radice tuberosa*). *Aristea major* closely matches this description, particularly regarding the crowded and relatively compact synflorescence of numerous, blue flowers borne at the apex of an unbranched flowering stem (or peduncle), usually 1–1.5 m high (Goldblatt & Manning, 2000). The distinctive, dense synflorescence may well have prompted the specific epithet *capitatus*, meaning head-like. *Aristea major* has a range extending from the Cape Peninsula north to the Picketberg and east through the coastal Cape mountains to George. It is likely that a plant from the Cape Peninsula or nearby was one that came to Linnaeus's attention before 1753, for exploration of the then Dutch colony had not extended significantly into the interior at that time. Thus, from both morphological and geographical points of view the selection of a specimen currently assignable to *A. major* seems the ideal choice as a neotype for *A. capitata*, and *A. major* thus falls into synonymy.

This selection will stabilize the taxonomy of *Aristea* sect. *Racemosae* and has the added benefit of circumventing a nomenclatural controversy about the identity of *Ixia thyrsiflora* D. Delaroche (1766), which is most likely a species of *Aristea*. N. E. Brown (1929) maintained that a specimen in the Burman Collection at Geneva was the type of *I. thyrsiflora*, and that it represented *A. major*, making this an earlier name for that species. Goldblatt and Barnard (1970) disagreed that the Geneva specimen was the type, citing discrepancies in the protologue between the description, Delaroche's manuscript notes (in the Leiden Herbarium), and the Burman specimen. We are not prepared to clarify the typification of *I. thyrsiflora* in this paper; however, due to the priority of publication the name *Aristea thyrsiflora* presents no threat to the stability of *A. capitata*.

Aristea capitata (L.) Ker Gawler, Curtis's Bot. Mag. 17: pl. 605. 1802. *Gladiolus capitatus* L., Sp. pl. 37. 1753. TYPE: South Africa. Western Cape: foot of Du Toit's Kloof, 15 Oct. 1949, W. F. Barker 6075 (neotype, designated here, NBG; isoneotypes, K, MO, PRE).

Aristea major Andrews, Bot. Repos. 3: pl. 160. 1801. TYPE: South Africa. Western Cape: without precise locality or collector, illustration in Andrews, Bot. Repos. 3: pl. 160. 1801.

Aristea thyrsiflora sensu N. E. Brown, Kew Bull. 1929: 36. 1929, non *Ixia thyrsiflora* D. Delaroché, Diss. pl. nov. 20. 1766.

In the imperfect 19th century taxonomy of *Aristea* sect. *Racemosae* more than one species was included under the name *Aristea capitata*, most commonly *A. bakeri* or *A. bracteata*. Weimarck (1940) made significant progress in distinguishing the species of the section, admitting in addition to *A. capitata*, *A. thyrsiflora* (with *A. major* as a synonym), *A. macrocarpa* (described in this monograph by G. J. Lewis), the nomenclaturally superfluous *A. caerulea* (Thunberg) Vahl, and *A. bakeri* Klatt. The name *A. capitata* was applied to plants that we cannot at present distinguish in any way from Lewis's *A. macrocarpa* except for the smooth spathes and bracts, but specimens cited by Weimarck include plants that we would now refer to *A. major*. Moreover, the reference illustration cited by Weimarck (1940) for *A. capitata*, Curtis's *Botanical Magazine* plate 605, also seems to differ in no significant way from *A. major*. Other members of *Aristea* sect. *Racemosae* that Weimarck recognized, but do not directly concern the history of *A. capitata*, are *A. junceifolia* Baker, *A. racemosa* Baker, and *A. rigidifolia* G. J. Lewis.

This paper also deals with two nomenclatural and taxonomic questions in *Aristea* sect. *Racemosae* related to the neotypification of *Gladiolus capitatus*: the correct name for *A. confusa* Goldblatt, a substitute name for the illegitimate and superfluous *A. caerulea* (Thunberg) Vahl (basonym *Moraea caerulea* Thunberg); and the circumscription and earliest names for plants currently called *A. bakeri* Klatt, *A. confusa*, and *A. macrocarpa* (Goldblatt & Manning, 2000).

THE CORRECT NAME FOR *ARISTEA CAERULEA*

In 1787 Thunberg described *Moraea caerulea* for what we now know was the second species of *Aristea* sect. *Racemosae* to be named, the first being *A. capitata*. In fact, specimens in the Thunberg collection at Uppsala, Sweden, show that his concept of *M. caerulea* included two species, the lectotype (effectively designated by Weimarck in 1940), which is now *Aristea bracteata*, and the species that we now call *A. capitata*. *Moraea caerulea* is superfluous under ICBN Art. 52.1 (Greuter et al., 2000), because Thunberg cited the name *Gladiolus capitatus* L. in the protologue which, under ICBN Art. 52.2, constitutes inclusion of its type. Since *M. ca-*

erulea is a superfluous basonym, it is illegitimate and not available for later use. Ker Gawler (1802) included *M. caerulea* in the synonymy of *A. capitata*, but other contemporaries evidently disagreed with him, and Vahl made the combination *A. caerulea* in 1805. South African born Hendrik Persoon (1805) also recognized *Aristea*, admitting five species to the genus, one of them *A. bracteata*, a new species, in which he included Thunberg's *Moraea caerulea*. Inclusion of that name in synonymy would seem to make *A. bracteata* a superfluous name, but inasmuch as *M. caerulea* is itself superfluous, Persoon's new name is valid and legitimate. Persoon cited the figure of *M. caerulea* in Thunberg's *Dissertatio de Moraea* (1787), which makes it easy to interpret *A. bracteata*, since Persoon probably did not see the specimens in Thunberg's collection, given the difficulties of travel and communication at the time. Thus, *A. bracteata* Persoon is a nomenclaturally acceptable name for *A. caerulea* (Thunberg) Vahl. The new name *A. monticola* proposed for *Moraea caerulea* (Goldblatt, 1971) becomes an unnecessary nomen novum and later synonym.

J. G. Baker followed Ker Gawler (1802) in treating *Aristea caerulea* as a synonym of *A. capitata* in his accounts of the genus in *Handbook of the Irideae* (1892) and *Flora Capensis* (1896), but Weimarck (1940) definitively recognized *A. caerulea*, pointing out its morphological differences including the conspicuously hispid-papillate, firm-textured spathes, relatively narrow leaves 3–6 mm wide, broad spathes and bracts, and relatively short capsules.

Aristea bracteata Persoon, Syn. pl. 1: 41. 1805, nom. nov. for *Moraea caerulea* Thunberg, *Dissertatio de Moraea* no. 12. 1787, nom. illeg. superfl. pro *Gladiolus capitatus* L. *Aristea caerulea* (Thunberg) Vahl, Enum. pl. 2: 124. 1805. *Aristea monticola* Goldblatt, J. S. African Bot. 37: 234. 1971. TYPE: South Africa. Without precise locality or date, *Thunberg s.n.* “*M. caerulea* α” (lectotype, designated by Weimarck (1940), UPS).

Aristea caerulea var. *robusta* Weimarck, Acta Univ. Lund, n.s. 36: 74. 1940. Syn. nov. TYPE: South Africa. Western Cape: without precise locality, Oct. 1915, R. Marloth 7173 (holotype, PRE).

Aristea caerulea var. *elongata* Weimarck, Acta Univ. Lund, n.s. 36: 73. 1940. Syn. nov. TYPE: South Africa. Western Cape: Saron, Sep. 1919, L. Bolus s.n. (syntypes, BOL 16739, K).

As outlined above, *Aristea bracteata* is readily recognized by the relatively large individual flower

clusters enclosed by broad, more or less dry, brown, firm-textured spathes and the relatively narrow leaves with prominent, hyaline margins. The spathes are also conspicuously scabrid or hispid, a feature shared with *A. rupicola* Goldblatt & J. C. Manning (1997) and *A. macrocarpa* (here included in *A. bakeri*), in which the character is weakly expressed and sometimes evidently absent. The latter species has distinctive, elongate capsules mostly 20–30 mm long and large flowers, the tepals ca. 20×15 mm versus $12\text{--}17 \times 12\text{--}15$ mm in *A. bracteata* (Lewis, 1950a, 1950b). As in other tall species of section *Racemosae*, there is some variation in branching pattern. Of the two additional varieties included in *A. caerulea* by Weimarck, *A. caerulea* var. *elongata* represents a plant with short lateral branches and sessile upper flower clusters, while variety *robusta* also has sessile upper flower clusters and capsules to 14 mm long, compared with capsules ca. 10 mm in the typical variety (Weimarck, 1940). We see no need to recognize these local variants.

The lectotypification of *Moraea caerulea* (Weimarck, 1940) is somewhat unsatisfactory, because Weimarck clearly designated the sheet annotated by Thunberg as “*M. caerulea* α ,” which consists only of the leafy part of the stem. In the protologue of *M. caerulea*, Thunberg listed two localities for his two collections (now mounted on three sheets), one from “between the Outeniqua Mts and the Langkloof” and the other from “hills around the Cape,” without linking the localities to specific herbarium sheets. The narrow leaves of “*M. caerulea* α ” belong with the flowering stem of the sheet marked “*M. caerulea* χ ,” which is the plant illustrated in the *Dissertatio* (plate 2, fig. 2) and specifically cited by Persoon. This plant corresponds to our interpretation of *A. bracteata*, and Thunberg’s cited locality, “hills around the Cape,” agrees with this interpretation. The specimen “*M. caerulea* β ” is the eastern form of *Aristea capitata* (presumably from “between the Outeniqua Mts and the Langkloof”). This form has darker rhipidial spathes and bracts and a somewhat less crowded synflorescence than the typical, western form.

DELIMITATION OF *ARISTEA BAKERI*

Among the robust members of *Aristea* sect. *Racemosae* are plants with a panicle-like, compound inflorescence, broad, fibrous, strap-like leaves, and capsules at least three times as long as wide and mostly 18–28 mm long, that contain 3 or 4 seeds in each locule. Originally plants with such compound inflorescences and broad leaves were in-

cluded in *A. capitata* sensu Ker Gawler (1802), probably because the capsules were not known. Baker (1892, Aug.) was the first to distinguish the species as *A. paniculata*, a later homonym of *A. paniculata* Pax (1892, Apr.). Klatt (1894) provided the replacement name *A. bakeri* shortly thereafter for Baker’s homonym, *A. paniculata*. *Aristea macrocarpa* was a new species described by the South African G. J. Lewis in Weimarck (1940) for plants until then included in *A. capitata*. Important features that Lewis used to distinguish *A. macrocarpa* were the elongate capsules, bristly abaxial surface of the spathes, and the entire, rust-brown bracts.

In view of Lewis’s recognition of *Aristea macrocarpa*, the inclusion by Weimarck (1940) of *A. capitata* in his account is puzzling. Weimarck associated the name with plants from the southern Cape and elsewhere, and cited, as a reference specimen, the illustration in *Curtis’s Botanical Magazine* pl. 605 (Ker Gawler, 1802), which we regard as *A. capitata* as the species is neotypified here. Specimens cited by Weimarck are either that species or few-branched specimens of *A. bakeri*. Equally puzzling is Lewis’s (1950c) account of *Aristea* in *Flora of the Cape Peninsula*, where she provided descriptions for both *A. macrocarpa* and *A. capitata*, and accommodated them in her key. Given the background Lewis gave for describing *A. macrocarpa* the treatment is, at best, confusing. Nevertheless, Lewis’s field understanding of the Iridaceae and of *Aristea* was widely held to be sound. Respecting that, Goldblatt (1971) provided an alternative, *A. confusa*, for plants from the Cape Peninsula called *A. capitata*. Lewis (1950c) distinguished *A. capitata* from *A. macrocarpa* by the smooth rather than hispidulous bracts, narrower tepals $16\text{--}20 \times 6\text{--}8$ mm (vs. 18×14 mm for the outer tepals in *A. macrocarpa*), and capsules 12–20 mm long. The habit and details of the spathes (except for the scabridity) were essentially identical between the two species while the capsules of *A. macrocarpa* are longer, 18–35 mm.

Weimarck (1940), however, recognized one more species, *Aristea bakeri*, that closely resembled *A. macrocarpa* in general habit, spathe morphology, and in the diagnostically critical elongate capsules. The range of *A. bakeri* extended from Riversdale and Knysna eastward to the Vanstaden’s River Mountains, thus overlapping that of Weimarck’s *A. capitata* (i.e., *A. confusa* sensu Goldblatt) in the west, the range of which was seen as extending from the Cape Peninsula eastward to Knysna. As mentioned in our key to the species of section *Racemosae* (Goldblatt & Manning, 1997), *Aristea bakeri* is separated from *A. capitata* sensu Weimarck

(and *A. confusa* Goldblatt) on doubtful grounds. Weimarck's key criteria were: bracts brown and persisting; branches of the synflorescence erect; seeds dark, 3–4(–5) mm long for *A. capitata*; versus bracts gray-green and caducous; branches of the synflorescence spreading; seeds brown, 1.5–2 mm long for *A. bakeri*.

The distinction simply does not hold when the specimens in southern African herbaria, most of them not seen by Weimarck and collected after the 1950s, are examined. Branching in the species is somewhat variable, and caducous bracts are misleading. The bracts (by which we assume Weimarck meant leaves subtending the branches, not the spathes or floral bracts) in fact rarely fall. Lastly, the seed size distinction does not seem correct, for seeds of plants collected since Weimarck's time do not fall into his two size classes. We conclude that there is but one wild species for plant specimens variously called *Aristea bakeri*, *A. confusa*, or *A. macrocarpa*. The earliest available and legitimate name is Klatt's (1894) *A. bakeri*.

Aristea bakeri Klatt, in Durand & Schinz, *Conspect. fl. afr.* 5: 169. 1895 [as 1894], nom. nov. for *Aristea paniculata* Baker, *Handb. Irid.* 144. 1892, Aug., nom. illeg., non *A. paniculata* Pax, *Bot. Jahrb. Syst.* 15: 151. 1892, April. TYPE: South Africa. Western Cape: Galgebosch, near Vanstaden's River, Dec. 1872, *P. MacOwan* 2077 (holotype, K; isotypes, GRA, SAM).

Aristea macrocarpa G. J. Lewis, in Weimarck, *Acta Univ. Lund.*, n.s. 36: 74. 1940. TYPE: South Africa. Western Cape: Cape Peninsula, Kirstenbosch, Nov. 1935, *G. J. Lewis* s.n. (holotype, BOL 21665).

Aristea confusa Goldblatt, *J. S. African Bot.* 36: 308. 1970. Syn. nov. TYPE: South Africa. Western Cape: Table Mountain, Nov. 1930, *T. P. Stokoe* s.n. (holotype, BOL 17518).

As circumscribed here, *Aristea bakeri* may be distinguished by the elongate, broadly winged capsules somewhat truncate at the apex and (12–)18–28(–35) mm long that contain 3 or 4 lamellate seeds per locule. The rhipidial spathes and bracts are broadly ovate, dry, rusty brown, and entire, although often becoming irregularly torn with age. Specimens from the west of its range, previously included in *A. macrocarpa*, have the abaxial surfaces of the spathes and sometimes the bracts lightly bristly or scabrid, a feature often obscure and visible only under the microscope, and even then sometimes only with careful examination. The open branching of the flexuose flowering stem helps distinguish the species from *A. capitata*, which has short capsules mostly 8–10 mm long and about

twice as long as wide, and narrow, lanceolate spathes and bracts, the margins of which are translucent and the midlines darkly pigmented. *Aristea bracteata*, which has prominently bristly spathes and bracts, can be distinguished by the larger rhipidia, slightly smaller flowers, short capsules 10–12(–14) mm long, and narrow leaves 3–6 mm wide.

Recent research in connection with the preparation of an account of *Aristea* in *Cape Plants* (Goldblatt & Manning, 2000) led us to conclude initially that *A. confusa* was conspecific with plants from the southeastern Cape called *A. bakeri* by Klatt (1894). At the time we still believed that *A. macrocarpa* was distinct from *A. bakeri*/*confusa* and separated them on the basis of the rhipidial spathes being scabrid-papillate (*A. macrocarpa*) or smooth (Goldblatt & Manning, 1997, 2000). That distinction is weak because the papillae are often poorly developed and seem to be absent in old inflorescences, and sometimes even in plants of the same collection. There appears to be no other distinction between the two species. Although we now include *A. macrocarpa* in *A. bakeri*, we recognize that the distinction in the spathe and bract vestiture may subsequently be linked with one or more characters that will prove our decision incorrect.

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